REMARKS

The applicants appreciate the Examiner's thorough examination of the application and request reexamination and reconsideration of the application in view of the following remarks.

The applicants appreciate and thank the Examiner for allowing claims 50-54.

The Examiner rejects claims 1, 4-7, 9, 15, 17, 35, 36, 38, 40, 42, 55 and 56 under 35 U.S.C. §102(b) as being anticipated by Takeuchi *et al.* or Bernstein as set forth in the previous Office Action mailed April 21, 2005. The Examiner also rejects claims 1, 2, 4-9, 10-14, 15-18, 19-34, 35-43, 55, and 56 under 35 USC §103(a) as being unpatentable over Takeuchi *et al.* or Bernstein for reasons noted in the prior Office Action.

In the instant Office Action, the Examiner also relies on Fig. 19 of Takeuchi and Figs. 3 and 4 of Bernstein to allege these references teach and disclose a flexural wave plate sensor that includes a comb pattern aligned with eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexure plate wave sensor. The Examiner admits that the electrode locations of Takeuchi and Bernstein would inherently coincide with at least some of the eigenmodes and alleges it would have been obvious to one skilled in the art to make such placements for increased efficiency.

The applicants' claimed flexural plate wave sensor utilizes a unique comb pattern over the flexural plate with drive teeth disposed across the entire length of the flexural plate. The comb pattern is aligned with eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplifies the operation and design of the flexural plate wave sensor.

To advance prosecution, the applicants have amended independent claims 1, 35, 36, 55 and 56 to now recite in part "the comb pattern aligned with a substantial number of eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexural plate wave sensor." When the comb pattern is aligned with a substantial number of the eigenmodes of the flexural plate, the number of eigenmodes excited is substantial reduced, e.g., to a single eigenmode, which may result in a single pronounced peak. This is in contrast to the "at least some of the eigenmodes" allegedly disclosed by Takeuchi or Bernstein and cited by the Examiner:

Moreover, Fig. 19 and the disclosure of Takeuchi cited by the Examiner (Col. 19, lines 37-53) does not teach, suggest, or disclose a flexural plate wave sensor that includes a comb pattern aligned with a substantial number of eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexural plate wave sensor.

Instead, Takeuchi teaches a pair of comb-shaped electrodes designed to satisfy a length-to-width ratio, or aspect ratio, that is specifically disclosed as not more than 0.25 or not less than 4.0. The direction of the arrangement of a large number of comb teeth is directed along the longitudinal direction of the vibrating section. This is used to achieve the same effect as the spiral configuration and the branched planar configuration:

> However, as shown in FIG. 19, the pair of electrodes 22a, 22b may have a comb-shaped configuration. In this embodiment, it is preferable that a pair of comb-shaped electrodes are formed, in which the shape of the vibrating section 16 satisfies a length-to-width ratio (aspect ratio) of not more than 0.25 or not less than 4.0, and the direction of arrangement of a large number of comb teeth is directed along the longitudinal direction of the vibrating section 16. When this condition is satisfied, the same effect as those obtained by using the spiral configuration and the branched planar configuration can be obtained by using the pair of electrodes 22a, 22b having the comb-shaped configuration. (Col. 19, lines 41-53, emphasis added).

The effect obtained using the spiral and branched planar configurations of Takeuchi relies on the bending displacement characteristic of the actuator element that is obtained by applying an electric field between the pair of electrodes (22a, 22b) in an asymmetrical relation to a reference electric field point. The bending displacement of the actuator element is observed while continuously changing the voltage applied to the actuator element. The bending displacement is positive when the actuator element makes bending displacement in a convex manner in a first direction and the direction of bending displacement is negative when the actuator element makes bending displacement in a concave manner. The measurement of the bending displacement is used to perform polarization treatment for the piezoelectric/electrostrictive layer.

In contrast, as shown above, the applicants' claimed flexural wave sensor includes a comb pattern that is aligned with a substantial number of eigenmodes that reduces the number of eigenmodes excited in the plate to simplify the operation and design of the flexural plate wave sensor. The applicants' claimed flexural plate wave sensor does not rely on satisfying a length-to-width or aspect ratio or on bending displacement characteristics to perform polarization treatment of a piezoelectric/electrostrictive layer.

Clearly, for the reasons shown above, Takeuchi also does not teach, suggest, or disclose each and every element of the applicants' invention as recited in independent claims 1, 35, 36, 55, and 56, namely, a flexural wave plate sensor that includes a comb pattern aligned with a substantial number of eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexural plate wave sensor.

Accordingly, independent claims 1, 35, 36, and 55 and 56 are patentable and allowable under 35 USC §102(b) over Takeuchi. Because claims 4-7, 9, 15, 17, and 38, 40 and 42 depend from allowable base claims, these claims are allowable under 35 USC §102(b) over Takeuchi for the same reasons.

Bernstein also does not teach, suggest, or disclose a flexural plate wave sensor that includes a comb pattern aligned with a substantial number of eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexure plate wave sensor.

Instead, Bernstein teaches and discloses varying the spacing of the fingers of electrodes so that the same voltage is generated by the electrical pair to accommodate for varying stresses on the diaphragm:

> To optimize the efficiency of the transducer the finger electrode spacing is varied so that the same voltage is generated between each electrical pair. This might be necessary when, for example, the stress on a diaphragm might not be uniform, hence the electric field (which is proportional to the stress) is non-uniform. Equally spaced finger electrodes would result in some inter-electrical gaps generating larger voltages than other gaps. The net result would be current flowing from one part of the transducer to another part, which is inefficient. High stress regions use closely spaced electrodes, while lower stress regions use electrode fingers further apart. (Col. 5, line 63 - Col. 6, line 8)

Clearly, varying the electrode spacing so that the same voltage is generated by the electrical pair to accommodate for varying stresses on the diaphragm is not the same as the applicants' claimed comb pattern disposed over the flexural plate that is aligned with a substantial number of eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexure plate wave sensor, as recited in applicants' independent claims 1, 35, 36, 55, and 56.

Accordingly, for the reasons shown above, Bernstein does not teach, suggest, or disclose each and every element of the applicants' invention as recited independent claims 1, 35, 36, 55, and 56, namely, a comb pattern over the flexural plate with drive teeth disposed across the entire length of the flexural plate and aligned with a substantial number eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexural plate wave sensor.

Accordingly, independent claims 1, 35, 36, and 55 and 56 are patentable and allowable under 35 U.S.C. §102(b) over Bernstein. Because claims 4-7, 9, 15, 17, and 38, 40 and 42 depend from allowable base claims, these claims are allowable under 35 USC §102(b) over Bernstein for these same reasons.

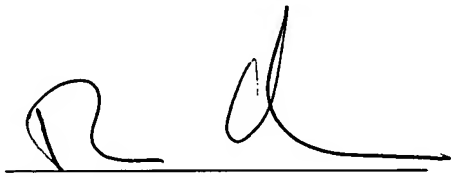
The Examiner rejects claims 1, 2, 4-9, 10-14, 15-18, 19-34, 35-43, 55, and 56 under 35 U.S.C. §103(a) as being unpatentable over Takeuchi *et al.* or Bernstein. As shown above, Takeuchi *et al.* and Bernstein alone or in combination with the prior art cited by the applicants do not teach, suggest or disclose a comb pattern over the flexural plate with drive teeth disposed across the entire length of the flexural plate and aligned with a substantial number eigenmodes of the flexural plate to reduce the number of eigenmodes excited in the plate and simplify the operation and design of the flexural plate wave sensor as recited applicants' amended independent claims 1, 35, 36, 55 and 56.

Accordingly, independent claims 1, 35, 36, 55 and 56 are allowable and patentable under 35 U.S.C §103(a) over Takeuchi *et al.* or Bernstein. Because claims 4-9, 10-14, 15-18, 19-34, and 36-43 depend from allowable base claims, these claims are also allowable and patentable under 35 U.S.C §103(a) over Takeuchi *et al.* or Bernstein for at least the same reasons.

Each of the Examiner's rejections has been addressed or traversed. Accordingly, it is respectfully submitted that the application is in condition for allowance. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates collect in Waltham, Massachusetts, at (781) 890-5678.

Respectfully submitted,



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